

Malnutrition in nursing home residents in the Netherlands, Germany and Austria : exploring and comparing influencing factors

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A grayscale photograph of three bell peppers resting on a light-colored wooden surface. One white bell pepper is in the upper left, cut open to show its internal structure. Two dark-colored bell peppers are positioned to its right and below. The word "Summary" is printed in a bold, black, sans-serif font over the dark peppers.

Summary

SUMMARY

For decades, malnutrition has continued to be an important and under-recognised problem in all healthcare settings. In European nursing homes, the prevalence rates of malnutrition range between 2% and 74%. This wide range is partly due to differences in actual prevalence rates, but also by differences in the way malnutrition is defined and the way malnutrition is measured. Prevalence studies show differences in study populations, care home settings and measurement instruments used. Malnutrition refers to negative deviations from a normal nutritional status and has been defined as an inadequate nutritional status, undernourishment due to poor dietary intake, poor appetite, muscle wasting and weight loss. It is a nutritional condition in which an insufficient or disproportionate intake of energy, protein, and other nutrients adversely affects tissue/body form (shape, size and composition) and function, and clinical outcomes. Malnutrition increases the risk of medical complications, weakens the immune function, leading to a higher risk of infections and impairs wound healing. Moreover, malnutrition impairs quality of life, increases length of hospital stay and costs of healthcare.

Age, gender, morbidity and care dependency, as well as infections, physical disabilities and polypharmacy are related to malnutrition. Furthermore characteristics of healthcare systems in different countries affect the way nutritional care is organised and therefore also influence malnutrition prevalence.

To assess quality of care integrally, the model of Donabedian is a useful and proven instrument. The model states that it is essential to focus on structural and process indicators and on outcome as well. According to Donabedian, an improvement in structure and process of care may lead to better outcomes. The model offers a good basis to develop a relevant measurement instrument to assess the quality of care.

In this thesis data from the LPZ-International study are used in order to answer the central question: Is there a difference in malnutrition prevalence and in quality indicators related to structure and process of nutritional care in nursing homes between the Netherlands, Germany and Austria? Furthermore we have also examined whether malnutrition prevalence is influenced by differences in structure and process indicators of nutritional care in these countries or if the prevalence rate is the result of differences in characteristics of nursing home residents in the Netherlands, Germany and Austria. The measurement instrument used in LPZ-International has been developed according to the framework of Donabedian.

Chapter 1 of this thesis is a general introduction dealing with malnutrition and the quality of care in nursing homes, but it also describes the aim and outlines of our study, as well as the research questions posed.

In **chapter 2** the overall study design of LPZ-International is described. It involves the design of an international multi-country study on the prevalence of care problems in different healthcare sectors (hospitals, care homes, home care) in different countries (the Netherlands, Austria, Switzerland and New Zealand), including pressure ulcers,

malnutrition, falls, use of restraints and incontinence. The study includes prevalence rates as representatives of *healthcare outcomes* and incorporates both *structural aspects of care*, for example the availability of enough and adequately skilled personnel, equipment and guidelines *and process factors of care*, including the preventive measures and treatment interventions undertaken to deal with the care problems mentioned above.

In the studies described in this thesis we only use data on malnutrition in nursing home residents in the Netherlands, Germany and Austria. At the time Chapter 2 was written, Germany had withdrawn from LPZ-International and therefore is not mentioned in the design article. However the earlier performed measurements in Germany (2008, 2009 and 2010) have been executed following the same methodology as described in the design article (chapter 2).

The first study with data from LPZ-International is presented in **chapter 3**. This comparative study investigates possible differences in malnutrition prevalence rates in Dutch and German nursing home residents. It provides insight into the screening, prevention and treatment of malnutrition and the indicators for nutritional care policy. Resident characteristics differed significantly between the two countries. Dutch residents were more often male, younger, more care-dependent and significantly more at risk of malnutrition. However, actual malnutrition prevalence rates did not differ significantly. All German residents were screened at admission, whereas this only was the case in 73.1% of the Dutch residents. Nutritional screening tools were used in 38.0% of the Dutch residents and 42.1% of the German residents. A dietician was consulted for 36.7% of the Dutch and 9.3% of the German malnourished residents. The proportion of malnourished residents receiving nutritional intervention was larger in Germany than in the Netherlands. Structural indicators for nutritional policy were fulfilled more often in the Netherlands at institutional level whereas in Germany they were fulfilled more often at ward level. Finally, it was concluded that German residents had a somewhat better nutritional status than Dutch residents and that more efforts are done to enhance the nutritional status of German residents.

In **chapters 4, 5 and 6** the influence of all components of the adapted quality model of Donabedian on the prevalence of malnutrition was analysed separately (resident characteristics, structure and process indicators of nutritional care). The influence of resident characteristics, structure and process indicators of nutritional care on the prevalence of malnutrition were investigated using univariate logistic Generalized Estimating Equation (GEE) regression analysis in order to build an association model.

Chapter 4 describes a cross-sectional, multi-centre study measuring malnutrition in nursing home residents from the Netherlands, Germany and Austria. The aim of this study was to investigate whether resident characteristics influence possible differences in malnutrition prevalence between countries. The prevalence of malnutrition in the Netherlands, Germany and Austria was respectively 18.0%, 20.0% and 22.7%. The multivariate GEE logistic regression analysis showed that gender, age, care dependency, the mean number of diseases and some specific diseases are influencing factors for

whether a resident is malnourished or not. The odds ratio of malnutrition in the three countries declined after including the influencing factors resulting from the multivariate GEE analysis.

The study revealed that differences in malnutrition prevalence rates in nursing homes in the Netherlands, Germany and Austria are influenced by various resident characteristics. Since other country related factors might also play an important role in influencing differences in malnutrition prevalence rates between countries (structure and process factors of malnutrition care policy), we recommend investigating these factors in future studies.

In **chapter 5** the same data were used as in the study presented in chapter 4. However the aim of this study was to explore whether structural quality indicators of nutritional care influence malnutrition prevalence in the Netherlands, Germany and Austria. Five structural quality indicators of nutritional care: (1) the care file includes an assessment as to the risk of malnutrition for each client, (2) the care file includes the intake for each client, (3) in case of (expected) malnutrition, a protein-and energy-enriched diet is provided in the ward as a matter of standard procedure, (4) at least one nurse in the ward is specialised in the area of malnutrition and (5) the nutritional status is assessed upon admission, were related to malnutrition and explain malnutrition prevalence variance between the Netherlands and Germany. However, the differences between the malnutrition prevalence rates of the Netherlands and Austria still existed after controlling for these structural quality indicators.

The study described in **chapter 6** focused on process indicators of nutritional care and resident characteristics, using the same data set as in the studies described in chapter 4 and 5. Process indicators of nutritional care were measured by questions about the prevention and treatment of malnutrition. Three questions on prevention were asked: *Was the patient screened at admission, how often is weight monitored and how often is intake monitored.* Furthermore one multicomponent question was asked about the treatment of malnourished residents (consulting a dietician, providing energy/protein-enriched diet, providing energy-enriched rations between meals, oral nutritional support and tube feeding). The multiple regression analyses showed that the following process indicators were related to malnutrition: *energy-enriched rations provided between meals, consulting a dietician, nutritional status is screened at admission, intravenous feeding, maximum required fluid intake, supplementary oral nutrition and feeding by intubation.* These variables explained the statistically significant difference in malnutrition prevalence between the Netherlands and Austria but not between the Netherlands and Germany. The difference between the Netherlands and Germany could additionally be explained by resident characteristics (care dependency, age, gender, mean number of diseases and specific diseases).

The last chapter (**chapter 7**) of this thesis includes a general discussion reflecting on the main findings of all studies described in the thesis. An annual, large-scale, multi-country and multi-centre study focusing on malnutrition in different health care settings is rather new in Europe. Such a study is important to ultimately increase the quality of

(nutritional) care in health care Europe wide, which is really necessary because this thesis again and clearly reveals that malnutrition is still a considerable problem in nursing home residents, since in all three countries one out of five residents was malnourished. LPZ-International seems to be a good method/instrument for this. The differences in malnutrition prevalence between the countries can be partly explained by differences in both resident characteristics and in structure and process indicators of nutritional care.

Based on the results of our studies we recommend further research into the influence of process and structure indicators of nutritional care by performing a longitudinal exploratory study. In future intervention studies, structure and process indicators can be implemented and followed over time to get insight in the real effects of adapting nutritional care policy and preventive and treatment measures.

Since we did not focus on all structural indicators of the Donabedian model future research could focus on factors like educational level of staff, number of staff, kind and organisational structure of institutions, size of institutions but also on other relevant differences in resident populations. Population differences and population size are important when comparing countries. To get more insight into possible causes of differences in malnutrition prevalence and its influencing factors, data should be corrected for differences in population size and characteristics like age, length of stay and morbidity. In addition, differences in healthcare systems and cultural differences should be taken into account as well, for example by assessing culturally depended eating habits.

From our studies we can conclude that it is important for nursing homes to explicitly pay attention to meeting relevant structural quality indicators of nutritional care on ward level, close to the primary care process. This may enable healthcare professionals directly in performing adequate nutritional care for residents with malnutrition or at risk of malnutrition. More concrete, this means that to decrease malnutrition prevalence rates in nursing home residents, paying attention to the following structural aspects is relevant: taking care of both the availability and implementation of a nutritional guideline as well as regular staff education on ward level, having a standard procedure of measuring weight, height and nutritional status at admission and during nursing home stay, the organisation of a regular discussion of patients at risk of or with malnutrition in multidisciplinary team meetings, paying attention to mealtime ambiance, availability of relevant nutritional interventions and having a standard policy to register relevant nutritional data in the resident's file.

With regard to process indicators of nutritional care it is important to implement the main elements of the total nutritional cycle into daily practice. This includes both nutritional screening and assessment leading to a nutritional diagnosis as well as application of adequate nutritional interventions with subsequent monitoring of their effects.

Since malnutrition is prevalent in one out of five nursing home residents, executing an annual prevalence measurement, such as LPZ-International, is crucial to keep awareness of malnutrition as a very relevant care problem.